SECTION 2

SERVICE INFORMATION

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1. ERROR RATE CONFIRMATION PROCEDURE

1. Function of Front Switch

1-1. Front Panel Bottom side

DIP SW	ON	OFF
SW1-1	•SERVICE mode (SERVICE MENU display) •SW1-2 to 1-4 Valid	•NORMAL mode (SET UP MENU display) •SW1-2 to 1-4 Invalid
SW1-2	Error Rate Display Mode: SLOW	Error Rate Display Mode: FAST
SW1-3	Force R/P Head Playback	Force PB Head Playback
SW1-4	VITABI Decode ON	VITABI Decode OFF

***NOTE:** In case of DIP SW1-1 is ON, SW1-2,1-3 and 1-4 becomes valid.

1-2. Front Panel Bottom section

	4F	2F
CF SW	Error Rate is display	Error Rate is not display

	ON	OFF
SYNCHRONIZE SW	Conceal OFF	Conceal ON

***NOTE:** In case of DIP SW1-1 is ON, above switches change the function as indicated as above table.

1-3. TC MODE SW (TC/CTL switch and TC/UB switch on the Front Panel)

Inner and Outer correction are set by combination of TC/CTL and TC/UB switches setting.

MODE	INNER Correction	OUTER Correction
CTL	OFF	OFF
TC	ON	OFF
UB	ON	ON

***NOTE:** In case of DIP SW1-1 is ON, above switches change the function as indicated as above table.

1-4. Correspond to Service Menu of Front Switches.

The Menu function in the RF ADJUST menu and Front switches are correspond as follows.

DIP SW1 (Front Panel Bottom side)

DIP SW	MENU No.	Item
SW1-2	B28	ERROR MODE
SW1-3	B27	PB MODE
SW1-4	B26	VITERBI MODE

(Front Panel Bottom section)

	MENU No.	Item
SYNCHRONIZE SW	B25	CONCEAL MODE

TC MODE SW (TC/CTL switch and TC/UB switch on the Front Panel)

MODE	MENU No.	Item
CTL, TC, UB	B24	ECC MODE

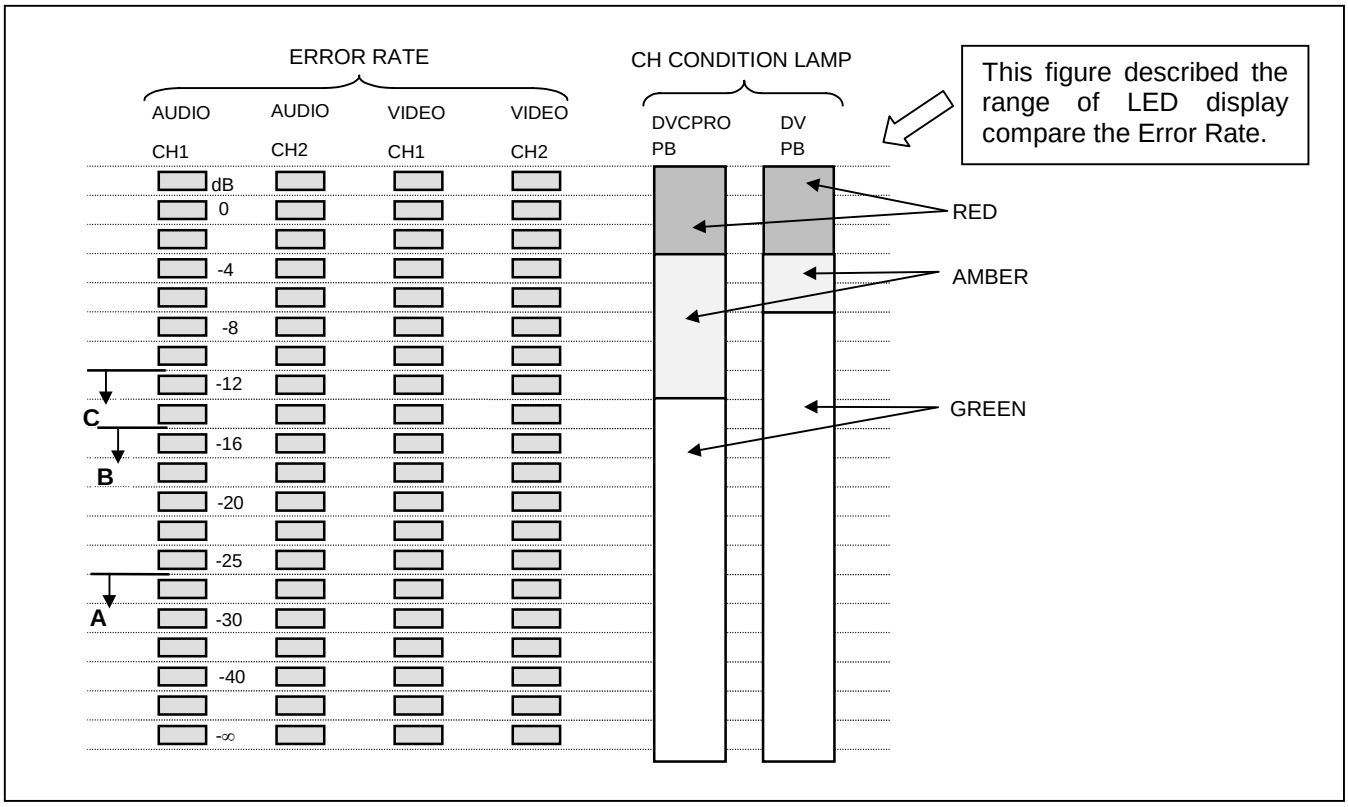
NOTE: Setting of Service Menu have priority to setting of Front Switches, when the Service Menu is open.

2. Condition of Error Rate display

①.DIP SW1-1 : **ON** ②.CF SW : **4F**	⇨	Audio Level Meter on the Front Panel changed to Error Rate display mode.

The Level Meter indicated as level of Error Rate, Audio CH1(Lch), Audio CH2(Rch), Video CH1(Lch) and Video CH2(Rch).
The Video and Audio Error Rate displayed on Level Meter as indicated as below figure.(front view at meter).

3. Specification of Error Rate



When confirm the Error Rate, please refer to specification of Error Rate as indicated as below, it level follow the menu setting as indicated as below table.

Menu setting

Item of the MENU	DVCPRO	DV
B28 : ERROR MODE	FAST	FAST
B27 : PB MODE	PB H	RP H
B26 : VITERBI MODE	ON	ON
B25 : CONCEAL MODE	ON	ON
B24 : ECC MODE	AL OFF	AL OFF

NOTE: Left side table described setting by Service Menu. Those setting can be set by Front SW as described as previous page.

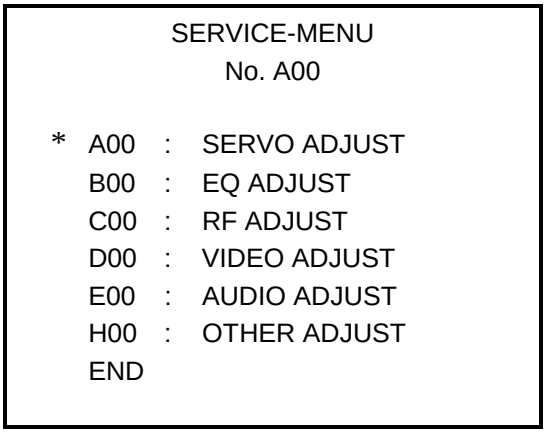
Specification of Error Rate

	VTR mode	Specification of Error Rate
DVCPRO (PB)	DVCPRO (PB Head) alignment tape playback	Under the "A" position at level meter
DV (R/P)	DV (RP Head) Alignment tape playback	Under the "B" position at level meter
DVCPRO (Confi)	DVCPRO confidence playback (REC mode)	Under the "C" position at level meter

2. Service Menu Information

< Operation Procedure >

(1) The “REMOTE/LOCAL” switch set to “LOCAL” on the front panel.
(2) Set the Dip SW 1-1 to ON position on the bottom side of front panel.
(3) Press the MENU button on the front panel, then appeared Main menu of Service menu on the screen as indicated as below.



MAIN Menu

(4) Move the star mark “*” by Search Dial to select the each Adjustment menu.
(5) Press the SET button, then open the Adjustment Menu follow the selected item (A00 to H00) on the Main menu.
(6) Each Adjustment item are selected by Search Dial.
(7) For change the value or setting, holding the Search button while rotate the Search Dial.(same way of SET UP menu).

< KEY function for Service Menu >

[MENU button] : ①. Move to Main menu on Service menu from SET UP menu.
②. Move to Main menu from ADJUST menu on the Service menu
③. Move to SET UP menu from Main menu on Service menu.
[SET button] : ①. Move to ADJUST menu from Main menu on Service menu.
[SERACH DIAL] : ①. Move the cursor “*” for select the each item.
②. Change the numerical value or setting of each item on ADJUST menu.
(Increase adjustment value by turn Search Dial to clockwise and decrease adjustment value by turn Search Dial to counter-clockwise.)
[SEARCH button] ①. For change the numerical value or setting value, holding this button while rotate the Search Dial.

< Store the adjustment and setting value to the memory >

When menu is escape from Adjustment menu to Main menu by press MENU button, each data write to the memory.

The contents of each “Adjustment menu” which are described on behind page.

Press the MENU button on the Main menu condition, then escape from Service menu mode.

A00:SERVO ADJUST

No.	ITEM	SETTING VALUE	CONTENTS OF SETTING and ADJUSTMENT	REMARK
A01	PG SHIFTER	0 ~ **1649** ~ 4095 0 ~ **1649** ~ 4095	(RISE display) PG SHIFTER AUTO ADJ (FALL display).	Elec. Adj
A02	T TORQUE	-128 ~ **0** ~ +127 Initial:0	Correct the offset value of T REEL MOTER DRIVE	Elec. Adj
A03	S TORQUE	-128 ~ **0** ~ +127 Initial:0	Correct the offset value of S REEL MOTER DRIVE	Elec. Adj
A04	PB GAIN P	-128 ~ **1** ~ +127	LISTA SENSITIVITY Adj. (PB HEAD)	LISTA
A05	PB LINEAR P	0 1 ON	LISTA LINEARITY Adj. (PB HEAD)	LISTA
A06	RP GAIN P	-128 ~ **1** ~ +127	LISTA SENSITIVITY Adj. (R/P HEAD)	LISTA
A07	RP LINEAR P	0 1 ON	LISTA LINEARITY Adj. (R/P HEAD)	LISTA
A08	RP GAIN	-128 ~ **1** ~ +127	LISTA CONSUMER DV COMPATIBILITY CONFIRMATION	LISTA
A09	RP LINEAR	0 1 ON	LISTA CONSUMER DV LINEARITY Adj.	LISTA
A10	MOTOR CHECK	0 OFF 1 CAP 2 DRUM 3 T REEL 4 S REEL		* NOT USED

B00:EQ ADJUST

Note: The mark "●" indicated as common adjustment item for DVCPRO and DV.

NO	ITEM	SETTING VALUE	CONTENTS OF SETTING and ADJUSTMENT	REMARK
B01	PB PLL PHASE	-128 ~ **40** ~ +127	PB PLL PHASE Adj. ●	Elec. Adj
B02	PB PLL SLICE	-128 ~ **-70** ~ +127	PB PLL SLICE LEVEL Adj. ●	Elec. Adj
B03	PB AEQ	-128 ~ +**75** ~ +127	PB AUTO EQ Adj. ●	Elec. Adj
B04	PB GAIN L	-128 ~ **+30** ~ +127	PB Lch EQ GAIN Adj. ●	Elec. Adj
B05	PB PHASE L	-128 ~ **-55** ~ +127	PB Lch EQ PHASE Adj. ●	Elec. Adj
B06	PB GAIN R	-128 ~ **+30** ~ +127	PB Rch EQ GAIN Adj. ●	Elec. Adj
B07	PB PHASE R	-128 ~ **-55** ~ +127	PB Rch EQ PHASE Adj. ●	Elec. Adj
B08	RP PLL PHASE	-128 ~ **+50** ~ +127	RP PLL PHASE Adj.	Elec. Adj
B09	RP PLL SLICE	-128 ~ **-70** ~ +127	RP PLL SLICE LEVEL Adj.	Elec. Adj
B10	RP AEQ	-128 ~ **+75** ~ +127	RP AUTO EQ Adj.	Elec. Adj
B11	RP GAIN L	-128 ~ **+30** ~ +127	RP Lch EQ GAIN Adj.	Elec. Adj
B12	RP PHASE L	-128 ~ **-55** ~ +127	RP Lch EQ PHASE Adj.	Elec. Adj
B13	RP GAIN R	-128 ~ **+30** ~ +127	RP Rch EQ GAIN Adj.	Elec. Adj
B14	RP PHASE R	-128 ~ **-55** ~ +127	RP Rch EQ PHASE Adj.	Elec. Adj
B15	VTB PHASE 1	-128 +127	VITABI A/D CLOCK PHASE Adj. (LSB)	
B16	VTB PHASE 2	-128 +127	VITABI A/D CLOCK PHASE Adj.	
B17	VTB PHASE 3	-128 +127	VITABI A/D CLOCK PHASE Adj. (MSB)	
B18	VTB PHS FINE	-128 ~ **-1** ~ +127	VITABI A/D CLOCK PHASE ADJ. (FINE Adj.)	
B19	PB MAIN DL	-128 ~ **-40** ~ +127	PB EQ DELAY LINE Adj. ●	Elec. Adj
B20	RP MAIN DL	-128 ~ **-40** ~ +127	RP EQ DELAY LINE Adj.	Elec. Adj
B21	PB PLL VCO	-128 ~ **+66** ~ +127	PB PLL VCO Adj.	
B22	RP PLL VCO	-128 ~ **+66** ~ +127	RP PLL VCO Adj.	
B23	VTB GAIN	-31 ~ **-15** ~ +32	VITABI A/D INPUT LEVEL Adj. ●	Elec. Adj
B24	ECC MODE	0 ALL ON 1 OT OFF 2 AL OFF	ERROR CORRECTION INNER ON/OUTER ON ERROR CORRECTION INNER ON/OUTER OFF ERROR CORRECTION INNER OFF/OUTER OFF	
B25	CONCEAL MODE	0 ON 1 OFF	ERROR CONCEALMENT ON ERROR CONCEALEMENT OFF *This CONCEAL MODE function is only effective, when the above ECC MODE set to "ALL ON".	

B26	VITABI MODE	0 AUTO 1 ON 2 OFF	VITABI ON VITABI ON VITABI OFF	
B27	PB MODE	0 PB H 1 RP H	FORCED PB HEAD PLAYBACK FORCED RP HEAD PLAYBACK	
B28	ERROR MODE	0 FAST 1 SLOW	ERROR DISPLAY MODE “FAST” ERROR DISPLAY MODE “SLOW”	
B29	EQ AUTO ADJ	0 STOP 1 START	 PB EQUALIZER AUTO Adj.	*NOT USED
B30	DEFAUT	0 LOAD 1 SAVE	LOAD THE FACTORY ADJUSTMENT VALUE SAVE THE ADJUSTMENT VALUE	

Note: The items (No. B24 to B28), which operated only active on the EQ ADJUST mode. And these function have priority over setting of DIP SW and Front SW as indicated as below.

1. Function of Front Switch
   Front Rear DIP SW

DIPSW	**ON**	**OFF**
SW1	•Service MENU SW2~4 Valid	•SET UPMENU •SW2~4 Invalid
SW2	Error Rate Display: SLOW	Error Rate Display: FAST
SW3	Force R/P Head Playback	Force PB Head Playback
SW4	Vitabi Decode ON	Vitabi Decode OFF

Front Bottom DISPLAY

	4F	**2F**
CF	Error Rate is displayed	Error Rate is not displayed.

	ON	**OFF**
SYNCHRONIZE	Conceal OFF	Conceal ON

Front TC MODE SW

	INNER Correction	**OUTER Correction**
CTL	OFF	OFF
TC	ON	OFF
UB	ON	ON

[How to LOAD or SAVE the adjustment value]

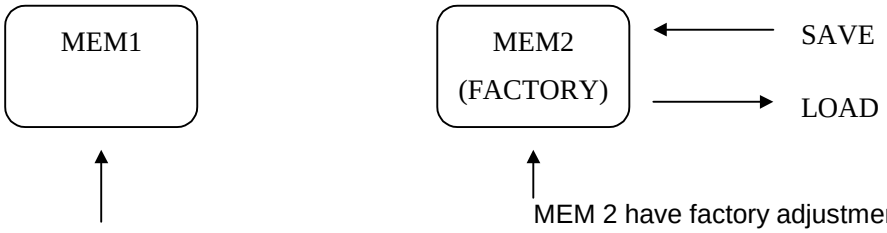
NOTE: This item (B30) is only active on the tape pass condition.

Press the SET button , the appear the message as indicated as below.

*SAVE
LOAD
END

Set the cursor "*" to SAVE or LOAD and press the SET button, then execute the program.

NOTE: 1. The VTR have two memory area for the adjustment value as indicated as below.



MEM 2 have factory adjustment value.

MEM 1 is always renewed follow the adjustment value on the RF and EQ adjustment menu.

2. We recommended the SAVE function does not use or the market, because the renewed adjustment value is stored to MEM 1 automatically.

C00:RF ADJUST

NO	ITEM	SETTING VALUE	CONTENTS OF SETTING and ADJUSTMENT	REMARK
C01	REC CURR L	-128 ~ **0** ~ +127	SETTING OF REC CURR (RP Lch)	Elec. Adj
C02	REC FREQ L	-128 ~ **0** ~ +127	SETTING OF REC FREQ (RP Lch)	Elec. Adj
C03	REC CURR R	-128 ~ **0** ~ +127	SETTING OF REC CURR (RP Rch)	Elec. Adj
C04	REC FREQ R	-128 ~ **0** ~ +127	SETTING OF REC FREQ (RP Rch)	Elec. Adj
C05	RE CURR L	-128 ~ **0** ~ +127	SETTING OF ERASE CURR (RE Lch)	Elec. Adj
C06	RE CURR R	-128 ~ **0** ~ +127	SETTING OF ERASE CURR (RE Rch)	Elec. Adj
C07	RP PHASE L	-128 ~ **0** ~ +127	RP Lch PLAYBACK PHASE CORRECTION	
C08	RP PHASE R	-128 ~ **0** ~ +127	RP Rch PLAYBACK PHASE CORRECTION	
C09	RP MAG L	-128 ~ **0** ~ +127	RP Lch PLAYBACK OUTPUT GAIN CORRECTION	
C10	RP MAG R	-128 ~ **0** ~ +127	RP Rch PLAYBACK OUTPUT GAIN CORRECTION	
C11	PB PHASE L	-128 ~ **0** ~ +127	PB Lch PLAYBACK PHASE CORRECTION	
C12	PB PHASE R	-128 ~ **0** ~ +127	PB Rch PLAYBACK PHASE CORRECTION	
C13	PB MAG L	-128 ~ **0** ~ +127	PB Lch PLAYBACK OUTPUT GAIN CORRECTION	
C14	PB MAG R	-128 ~ **0** ~ +127	PB Rch PLAYBACK OUTPUT GAIN CORRECTION	
C15	REC SIG	0 NORMAL 1 CW		* NOT USED
C16	ECC MODE	0 ALL ON 1 OT OFF 2 AL OFF		
C17	CONCEAL MODE	0 ON 1 OFF		
C18	VITERBI MODE	0 AUTO 1 ON 2 OFF		
C19	PB MODE	0 PB H 1 RP H		
C20	ERROR MODE	0 FAST 1 SLOW	ERROR RATE INDICATION FAST ERROR RATE INDICATION SLOW	
C21	TRACKING MOD	0 ATF 1 CTL	SELECTION OF TRACKING CONTROL MODE *This function is only active on the service Menu mode.	
C22	TRACKING VAL	-128 ~ **0** ~ +127 Initial: 0	" IN CASE OF SELECT THE CTL MODE ON ABOVE ITEM C20, TRACKING VALUE IS ADJUSTABLE" *TRACKING VALUE RANGE DATA 0 - 116 : RELATIVE TO 1 TRACK THEREFORE 0 TO 127 IS RELATIVE TO JUST OVER 18 um	
C23	REC OPTIMAIZ	0 STOP 1 START		* NOT USED
C24	DEFAUT	0 LOAD 1 SAVE	LOAD THE FACTORY ADJUSTMENT VALUE SAVE THE ADJUSTMENT VALUE	

D00:VIDEO ADJUST

NO	ITEM	SETTING VALUE	CONTENTS OF SETTING and ADJUSTMENT	REMARK
D01	VIDEO BLANK	0 NORMAL 1 OFF	NORMAL : The video signal is blanked at video edge portion for protect the overshoot. OFF : Release the blanking function.	ELEC. ADJ.
D02	V IN PLL	0 OFF 1 ON		
D03	VIDEO MUTE	0 NORMAL 1 MUTE		
D04	SELF DUB GEN	0 OFF 1 3RD 2 10TH		* NOT USED
D05	DUBBING MODE	0 FREEZE 1 REPEAT		* NOT USED
D06	EE TEST MODE	0 NORMAL 1 DCI RT		
D07	HEAD SELECT	0 PB. REC 1 PB 2 REC. PB 3 REC	PRIOR TO PB HEAD FORCED PB HEAD PRIOR TO REC HEAD FORCED REC HEAD	
D08	V SETUP =NTSC ONLY=	0 OFF 1 ON	VALID / INVALID SELECTION FOR SETUP MENU 613 : VIN SETUP AND 614 : VOUT SETUP 0 : SETUP MENU 613/614 NO DISPLAY 1 : SETUP MENU 613/614 DISPLAY	
D10	CMPNT HUE =NTSC ONLY=	0 OFF 1 ON	VALID / INVALID SELECTION FOR SETUP MENU 615 : CMPNT HUE 0 : SETUP MENU 615 NO DISPLAY 1 : SETUP MENU 615 DISPLAY	
D11	CMPNT SET UP =NTSC ONLY=	0 OFF 1 ON	VALID / INVALID SELECTION FOR SETUP MENU 616 : CMPNT SET UP 0 : SETUP MENU 616 NO DISPLAY 1 : SETUP MENU 616 DISPLAY	
D13	TELETEXT INI =NTSC ONLY=	0 MOJI 1 NABTS	SELECT DEFALUT FACTORY (DEFALUT) VALUE OF IIEM 802:TELETEXT SEL ON SET UP MENU. 0 : MOJI (FOR DOMESTIC) 0 : NABTS (FOR OVERSEAS)	

E00:AUDIO ADJUST

NO.	ITEM	SETTING VALUE	CONTENTS OF SETTING and ADJUSTMENT	REMARK
E01	MASTER REF	0 FS-20 1 FS-18 2 FS-12	Select the position of " Reference level marker " on the Audio level Meter (CH1, CH2, CUE). 0: Set to -20dB position (For NTSC) 1: Set to -18dB position (For PAL) 2: Set to -12dB Position	
E05	REF LEVEL2	0 0dB 1 -3dB	VALID / INVALID SELECTION IN/OUT REFERENCE LEVEL FOR SET UP MENU. 0: VALID SELECTION -20 / 0 / +4dB 1: ONLY -3dB	
E06	A VCO ADJ	0 NORMAL 1 48KHz 2 44KHz 3 32KHz	SELECT THE ADJUSTMENT MODE OF AUDIO VCO ADJUSTMENT MODE.	
E07	MIC IN LEV	0 DIS 1 ENA	VALID / INVALID SELECTION -60dB FOR SET UP MENU. 700 : CH1 IN LV AND 701 : CH2 IN LV 0: VALID SELECTION +4dB / 0 / -20dB 1: VALID SELECTION +4dB / 0 / -20dB / -60dB	

H00:OTHER ADJUST

H01	STILL LIMIT	0 2min 1 1min	SELECTED UPPER LIMITED VALUE OF ITEM 400:STILL TIMER ON SET UP MENU. 0: 2min 1: 6min	

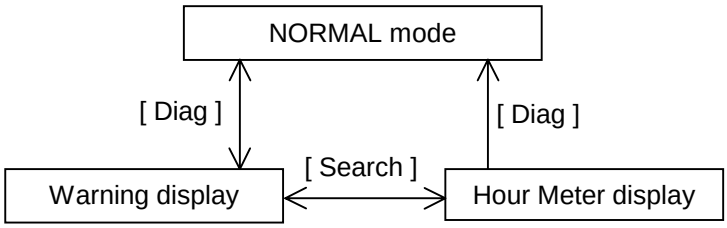
3. HOW TO RESET THE HOUR METER

(1) Set the DIP SW 1-1 to OFF (Normal mode) position on the front panel bottom side.
(2) Set the Dip SW 501-1 to ON and Dip SW 501-2 to OFF position on the SYSCON P.C.B.
(3) Press “DIAG” button on the front panel, then appeared Warning Message on the screen.
NOTE: Normally message of “NO WARNING” appeared on the screen.
(4) Press “SEARCH” button on the front panel, then appeared HOUR METER information on the screen as indicated as below.

DIAG-MENU HOUR METER

***H00 : OPERATION**	**200H**
H01 : DRUM RUN	**50H**
H02 : TAPE RUN	**30H**
H03 : THERADING	**100H**
H11 : DRUM RUN r	**50H**
H12 : TAPE RUN r	**30H**
H13 : THERADING r	**100H**

[Display mode]



(5) Set the cursor to mark “r” indicated item (item No.11,12 or 13) and press the “RESET” button on the front panel, then appeared message on the screen as indicated as below.

HOURS METER INIT SET

DRUM RUN r OK?
YES <PLAY> NO <STOP>

***** When press the “PLAY” button, then execute the reset function.
When press the “STOP” button, then cancel the reset command.

4. HOW TO CONFIRM THE SOFTWARE VERSION

1. Turn on the power.
2. Press the EJECT button.
3. Press the PLAY and STOP button simultaneously, then displayed the soft version on the counter display of the front panel.

   <example> FRONT n 1.00 - 01 - 1.00

4. Press the PLAY and STOP button repeatedly, change the display of all soft version in order as indicated as below.

   SYSCON → SERVO → A/V → SBC 1 → SBC 2 →I/F → FRONT

ROM location indicated as below table

Name	Reference number and Board
SYSCON	IC2 (SYSCON Board)
SERVO	IC235 (SERVO Board)
A/V	IC702 (A/V Board)
SBC 1	IC870 (REC PB Board)
SBC 2	IC910 (REC PB Board)
I/F	IC503 (SYSCON Board)
FRONT	IC2 (FRONT CPU Board)

5. Replacement Procedure of the P. C. Board

Please refer to below table, It indicated as which board is necessary adjustment after board exchanged. And perform the adjustment follow the adjustment procedure on this manual.

	Board	Adj.		Board	Adj.		Board	Adj.
F1	SERVO	○	F5	REC PB	○	H2	CUE	○
F2	SYSCON	○	F6	V IN	○	H3	EQ	○
F3	SIF(Option)	----	F7	A PROC	×	H4	RF AMP	○
F4	V OUT	○	F8	ADDA	○	----	HEAD BUFF	×

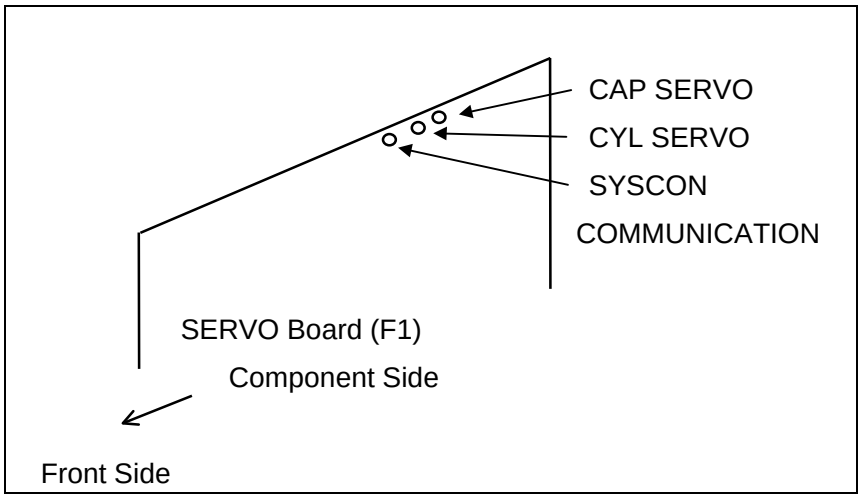
NOTE: 1. If there is a ROM on P.C.Board, please confirm the software version. Refer to confirmation procedure of software version on previous page.

2. The DATA RAM(IC17) is installed on SYSCON Board and it data can not saved to other equipment.. When SYSCON Board exchanged, remove the IC17 on original Board and put it to New Board. Another way of move the data, write down all of User data, Service data and numerical value of Hour Meter and input the data to new RAM. But numerical value of Hour Meter can not input to VTR (Hour Meter information will be reset).

6. SERVO LED INFORMATION

SERVO LED light on Front Panel, when Cylinder and Capstan Servo are locked. In case of SERVO LED does not light on PLAY or REC condition, please check at LED condition on Servo P.C.Board for confirm the which Servo is faulty.

There are condition LED on the SERVO Board (F1) as follows.



- The LED nearest to front side light up, when Syscon CPU and SERVO CPU communication is correct.
- The center LED light up, when the cylinder servo is locked.
- The LED nearest to the Jack Board light up, when the capstan servo is locked.

Note: In case of capstan servo does not locked, please use function of Tracking mode selection on Service menu for confirm which servo is fault ATF or CTL.

7. Auto Off Error Message

In case of AUTO OFF Error is occurred, AUTO OFF LED light and error message appear on the Front Panel.

The number of below table indicates as priority display of message, when some error occurred at the same time.

No.	Display (20 characters)	Contents	VTR Operation	Detection Place	Reset Condition
1	Normal (EJECT)	After a cassette insertion, if cassette does not down within 6 seconds, VTR goes to EJECT mode.	EJECT	SYSCON	---
	FRONT LOAD MOTOR	After EJECT mode, if a cassette does not up within 6 seconds, [AUTO OFF] LED turns on and the message flashes.	STOP	SYSCON	POWER OFF → ON
2	Normal (EJECT)	Loading is not completed within 6 seconds, VTR goes to EJECT mode (unloading mode).	EJECT	SYSCON	---
	LOADING MOTOR	When unloading is not completed within 6 seconds, [AUTO OFF] LED turns on and message flashes.	STOP	SYSCON	POWER OFF → ON
3	SERVO CONTROL ERROR	If servo CPU does not respond within 1 seconds, [AUTO OFF] LED turns on and message flashes. <Actual Judgment> System control circuit sends COMM_TEST signal to Servo circuit and Servo circuit returns COMM_TEST_RET signal. If this signal is not returned within 1 seconds, “AUTO OFF” process is produced and Servo is reset for 50 ms.	STOP	SYSCON	POWER OFF → ON
4	SERVO ERROR	If only the Servo CPU perform reset operation by momentary power off, “AUTO OFF” occurred.	STOP	SYSCON	POWER OFF → ON

5	SERVO COMM ERROR	If Servo CPU does not response to command from SYSCON CPU during 10 second “AUTO OFF” LED is flashed.	STOP	SYSCON	POWER OFF → ON
6	FRONT LOAD ERROR	If Supply Reel Table rotated over time at Tape big./ end detected operation during Front loading	STOP	SERVO	POWER OFF → ON
7	WIND UP REEL NOT ROTA	When Capstan shaft send the tape 3 cm, Take-up reel FG count number is less than regulation value.	STOP	SERVO	POWER OFF → ON
8	WIND UP ERROR	Compare the tape movement between take up and supply reel, and if the difference is more than 2 cm, goes to “AUTO OFF” mode.	STOP	SERVO	POWER OFF → ON
10	UNLOAD ERROR	Reel does not wind the tape in the unloading mode. Reel FG is counted in each mechanism mode.	STOP	SERVO	POWER OFF → ON
12	S-FF/REW TIME/OVER	Reel operation does not finish at Tape beginning and end position.	STOP	SERVO	POWER OFF → ON
14	DRUM ROTATE TOO SLOW	Cylinder rotary speed is too slow. In the cylinder on mode, cylinder PG interval is more than 1.5 ms for 5 seconds or cylinder PG is not detected for 1 seconds.	STOP	SERVO	POWER OFF → ON
15	DRUM ROTAE TOO FAST	Cylinder rotary speed is too fast. PG interval is less than 3 ms for 2 seconds.	STOP	SERVO	POWER OFF → ON
16	CAP ROTATE TOO SLOW	Capstan rotary speed is too slow. In the capstan on mode, capstan FG is not detected for 5 seconds.	STOP	SERVO	POWER OFF → ON
19	S REEL ROTATE TOO FAST	S-REEL Rotation speed became too high more than 2 seconds.	STOP	SERVO	POWER OFF → ON

22	T-REEL ROTA TOO FAST	T-REEL Rotation speed became too high more than 2 seconds.	STOP	SERVO	POWER OFF → ON
24	T-REEL TORQUE ERROR	In the Reel mode, exceed reel torque, caused by tape run over load, is detected. If the T Reel Torque error voltage is more than 0.5V continuously, goes to Auto Off mode within 105 seconds.	STOP	SERVO	POWER OFF → ON
25	S-REEL TORQUE ERROR	In the Reel mode, exceed reel torque, caused by tape run over load, is detected. If the S Reel Torque error voltage is more than 0.5V continuously, goes to Auto off mode within 105 seconds or Over current flow to Reel Motor more than 0.55A for 2 seconds.	STOP	SERVO	POWER OFF → ON
26	CAP Tension Error	Tension error is detected in capstan mode. Tension sensor voltage (SERVO : TP201) is more than 4.7 V or less than 0.3 V for 2 seconds.	STOP	SERVO	POWER OFF → ON
27	REEL Tension Error	Tension error is detected in Reel mode. Tension sensor voltage (SERVO : TP201) is more than 4.7 V or less than 0.3 V for 2 seconds.	STOP	SERVO	POWER OFF → ON
28	REEL DIR UNMATCH	Take up Reel direction error is detected. Rotation of Take-up reel in opposite direction has continued through complete turn except speed 0 (stop)	STOP	SERVO	POWER OFF → ON

40	DEW	If the condensation has formed inside the VTR, [Auto Off] LED turns on and the message flushes, then VTR goes to Eject mode. <Reset Condition> After the cassette is ejected, Drum rotated to dry out the condensation. When condensation has been removed, message is cleaned and normal operation is enable. NOTE: 1) Drum rotated, when the condensation is detected inside the VTR. 2) If the condensation is detected, when insert the cassette to VTR.	EJECT	SYSCON	AFTER CONDEN-SATION is REMO-VED Refer to CON-TENTS
41	E-FF	The tape beginning and end position are detected simultaneously during loading or after loading completed mode.	STOP	SYSCON	POWER OFF → ON

* Other Operation.

1) If the Reel Base unit does not move to prescribed position within 3 seconds, Reel Motor goes to stop and the cassette is ejected.

8. AUTO OFF Check Point Table

Message	Check Point	
WINDUP_REEL_NOT_ROTA	Check the loosen of the tape before power on. ● S Reel side before capstan motor → S Reel side is abnormal at REV mode. ● T Reel side after capstan motor → T Reel side is abnormal at FWD mode	1. Check the dead point of Reel Motor in the Reel Torque Offset Adjustment mode. (Front Rear SW: 1-1 ON, MENU_SW ON, SET_SW ON) [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Check Servo board Motor Drive circuit (F1 board) TRH ± 1,2,3, SHR ± 1,2,3--- Fig. 1 TRM1,2,3, SRM1,2,3 --Fig. 2 ● Check Reel Motor Replace Reel Motor 2. Check Reel Brake Solenoid (Check the Reel Brake is smoothly released in the Reel Torque Offset Adjustment mode.) [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Check System Control board (F2 board) Solenoid Drive circuit S_BRAKE_N, T_BRAKE_N --- Fig. 3 3. Grease is not attached on the tape pass.

WINDUP_ERROR		1. Check the tension is normal. ● Check Spring power --- Refer to the specification of Tension Regulator Spring Adjustment ● Check Tension Voltage --- Refer to the Tension Voltage Check 1 Refer to the Tension Control Check. 2. Check the FG waveform is normal. Capstan FG --- Refer to Capstan FG Check 1 and Capstan FG Check 2 Reel FG --- Refer to Reel FG Check 1 and Reel FG Check 2 3. Check Reel Offset Torque --- Refer to Motor Torque Offset Adjustment. 4. Check Tape Pass Load 5. Check Tape Damage

UNLOAD_ERROR	Check the tape is surely wound.	1. Check dead point of Reel Motor in the Reel Torque Offset Adjustment mode. (Front Rear SW: 1-1 ON, MENU_SW ON, SET_SW ON) [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board Check Motor Drive circuit (F1 board) TRH ± 1,2,3, SHR ± 1,2,3--- Fig. 1 TRM1,2,3, SRM1,2,3 --Fig. 2 ● Check Reel Motor Replace Reel Motor. 2. Check Reel Torque Offset [In case of abnormal condition] Re-adjustment --- Motor Torque Offset Adjustment 3. Check Reel Brake Solenoid (Check the Reel Brake is smoothly released in the Reel Torque Offset Adjustment mode.) [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Check System Control board (F2 board) Solenoid Drive circuit S_BRAKE_N, T_BRAKE_N --- Fig. 3 4. Check Reel FG Reel FG --- Refer to Reel FG Check 1 and Reel FG Check 2

S_FF/REW_TIMEOVER	Check the problem occurred at tape beginning or tape, or other portion.	1. Check Reel FG Reel FG --- Refer to Reel FG Check 1 and Reel FG Check 2 [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Reel FG Sensor, Reel Replacement ● Check F1 board. 2. Check transparent tape detection. [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Replace sensors. ● Check F2 board. 3. Check the tape is not bent.
S_REEL_ROTA_TOO_FAST		1. Check Reel FG waveform. Reel FG --- Refer to Reel FG Check 1 and Reel FG Check 2 [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Reel FG Sensor, Reel Replacement ● Check F1 board. 2. Check Reel Drive circuit. TP450 and TP451 on F1 board --- less than 0.4 V

T_REEL_ROTA_TOO_FAST		1. Check Reel FG waveform. Reel FG --- Refer to Reel FG Check 1 and Reel FG Check 2 [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Reel FG Sensor, Reel Replacement ● Check F1 board. 2. Check Reel Drive circuit. TP450 and TP451 on F1 board --- less than 0.4 V
T_REEL_TORQUE_ERROR		1. Check Reel Torque Offset [In case of abnormal condition] Re-adjustment --- Motor Torque Offset Adjustment 2. Check Reel Brake Solenoid (Check the Reel Brake is smoothly released in the Reel Torque Offset Adjustment mode.) [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Check System Control board (F2 board) Solenoid Drive circuit S_BRAKE_N, T_BRAKE_N --- Fig. 3

S_REEL_TORQUE_ERROR		1. Check Reel Torque Offset [In case of abnormal condition] Re-adjustment --- Motor Torque Offset Adjustment 2. Check Reel Brake Solenoid (Check the Reel Brake is smoothly released in the Reel Torque Offset Adjustment mode.) [In case of abnormal condition] ● Check loosen of connector Mech I/F board, Mother board ● Check System Control board (F2 board) Solenoid Drive circuit S_BRAKE_N, T_BRAKE_N --- Fig. 3
DRUM_ROTATE_TOO_FAST		Check Cylinder PG Check Cylinder FG [In case of fast rotation] ● Check Cylinder flexible cable, connectors. ● Check CYL_ERR (TP400) voltage. Normal Rotation : TP400 = about 2.5 V During Full Acceleration : TP400 = 0 V EJECT mode : TP400 = 2.5 V Servo REF (IC207-2 pin) = about 2.5 V fix If above voltage is incorrect, servo board is not correct. [In case of FG is correct and PG is incorrect] PG signal flow is incorrect. (Cylinder >> Mech I/F >> Mother >> Servo)

DRUM_ROTATE_TOO_SLOW	Check that the tape is stick with the Cylinder. Check that the tape is stick with a part of the tape pass and it causes the high tension. In this case tape may brake the Cylinder rotation.	Check Cylinder PG Check Cylinder FG [In case of FG is correct and PG is incorrect] PG signal flow is incorrect. (Cylinder >> Mech I/F >> Mother >> Servo) [In case of both PG and FG are incorrect (Cylinder rotation is actually slow.)] (1) Check Cylinder Unit. Rotate the Cylinder in EJECT or UNLOAD condition. Check that the Cylinder smoothly rotate. If it is not smooth, the Cylinder unit is incorrect. (2) Check the rotary speed detection. Check that the CYL_FG_PRE (TP231) shows the pulse which is 4 pulses per rotation and the duty is 50 %, 0V/5V. If it is incorrect, FG signal flow is incorrect. (3) Check the Servo CPU outputs acceleration command. ● Check that acceleration voltage (less than 2.5 V) is output at CYL_ERR (TP400). ● Check that drive on signal which is 5 V at IC400-4 pin. when it is 2.5 V, it is OFF mode. (4) Check the Reference voltage. Check that SERVO_REF (IC207-2 pin) voltage is about 2.5 V. -→ If (3) or (4) is incorrect, surround circuit of CPU, D/A is incorrect. (5) Check that Power Supply voltage. Check that Drive IC voltage (VCC 5V : IC400-27 pin) and Motor Drive voltage CYL_VM (Q400 -1 or 8 pin). The VM is positive voltage during Cylinder ON. → If it is correct, between Motor Drive and Cylinder is incorrect. Check connectors of Cylinder, Mech I/F and Mother.

CAP_ROTATE_TOO_SLOW	Check the tape is not stacked with the tape pass and tension is not high. Check the mechanical load of Capstan.	Refer to Capstan FG check (1) and (2). ● In case of the Capstan Motor overrunning even the message is too slow. The FG signal which is used to detect capstan speed is not supplied to the SERVO CPU. Check the frequency at CAP_FG1,2 (TP80, 82) is correspond with the rotary speed. (about 1.58 kHz, 0/5 V in REC/PB mode). Check the connectors of Capstan, Mech I/F and Mother. ● In case of Capstan does not rotate. (1) Check the Servo CPU supplies the acceleration command. Check the SERVO_REF (IC207-2 pin) is about 2.5V. Check the CAP_ERR (TP401) is acceleration command. It is below than SERVO_REF voltage. If the capstan does not rotate, the CAP_ERR voltage should be 0 V. Check Drive ON signal (IC401 - 4 pin) i s 5 V (rev) and 0 V (fwd), 2.5 V (OFF). (2) Check the Power Supply voltage. Check the Drive IC power voltage (VCC 5V : IC401 - 27 pin). Check Motor Drive voltage CAP_VM (Q402 - 1 or 8 pin). (3) Check the Drive signal is supplied to Capstan motor. Check the connectors of Capstan, Mech I/F and Mother. If above conditions are correct, motor or drive circuit is incorrect.

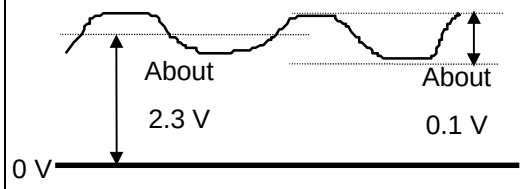
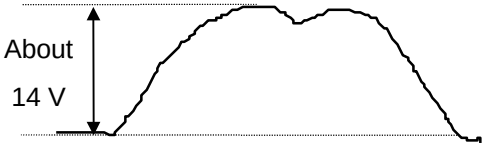
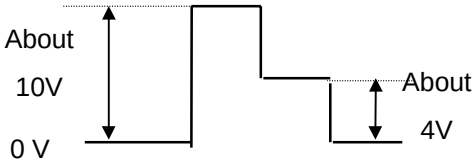
Fig 1 REEL Position Detect		Rotate the REEL motor in EJECT mode and check the following waveform. F1 board P2 - 10a TRH1+ 10b TRH1- 10c TRH2+ 11a TRH2- 11b TRH3+ 11c TRH3- 12c SRH1+ 13a SRH1- 13b SRH2+ 13c SRH2- 14a SRH3+ 14b SRH3-
Fig2 REEL Drive Waveform		Set Front Rear SW 1-1 ON. Select T or S_REEL_TRQ on the MENU, and rotate the REEL and confirm the following waveform is like Fig. 2. F1 board P2-23b TRM3 23c TRM1 24c TRM2 25b SRM3 25c SRM1 26c SRM2

Fig. 3 Brake Solenoid		Set Front Rear SW 1-1 ON. Select T or S_REEL_TRQ on the MENU, and check the waveform like Fig. 3 appears at following positions at Brake is released. ● T_REEL_TRQ selection F2 board P2 -25C T_BRAKE_N ● S_REEL_TRQ selection F2 board P2 -23C S_BRAKE_N